## IMPLANTATING IONS IN SHALLOW TRENCH ISOLATION STRUCTURES Abstract of the Disclosure

Ions are implanted into the dielectric layer and/or

barrier layer over a semiconductor substrate to change the
polish rates of either or both layers during formation of a
shallow trench isolation (STI) structure. The ion
implantation can change or affect the polish rates of the
material and the polish selectivity, and reduce or minimize

unwanted topography resulting from chemical mechanical
polishing (CMP). After CMP, the resulting STI structure
has a more uniform and smooth topography.